

**Commonwealth of Kentucky**  
**Division for Air Quality**  
***PERMIT STATEMENT OF BASIS***

(For Synthetic Minor permits only)

Federally-Enforceable Synthetic Minor/Title V Draft Permit - No. V-00-023

GRANE CREEK, LLC – HENDERSON GENERATING STATION

STATE HIGHWAY 2097

HENDERSON, KY 42410

June 20, 2000

BRYAN HANDY-PERMIT ENGINEER

a. Source Description:

The proposed project is to be located in Henderson County, Kentucky near Henderson. Grane Creek, LLC of Herndon, Virginia is proposing to construct an independent power production facility, a peaking station, consisting of six (6) simple-cycle gas-fired combustion turbines with three support units (a fuel gas heater rated at 14.77 mmBTU/hour, a natural gas-fired space heater rated at 0.5 mmBTU/hour, and diesel-fired emergency fire water pump). Additionally, there will be a natural gas fuel handling system with minimal fugitive emissions. The six turbines will be General Electric (GE) model PG7121 (EA), each with a nominal maximum generation capacity of 85 MW. The combustion turbines have a nominal maximum fuel input capacity of 981 mmBTU/hour each. The turbines will be equipped with dry low-nitrogen oxide burners for nitrogen oxides (NO<sub>x</sub>) emission control, and catalytic oxidation for carbon monoxide (CO) emission control. The only fuel to be fired in the turbines is natural gas.

b. Facility Location and Attainment Status:

This facility is located in Henderson County, Kentucky. Henderson County is classified as attainment or cannot be classified for all criteria pollutants.

c. Comments:

1. Emission factors and their source:

Emission factors for the gas-fired combustion turbines are based on General Electric vendor data, shown in tables B-1 and B-2 of the application. The annual emissions are based on the turbine performance at the average annual temperature of 59°F and 100% load. The facility wide emissions cap of 249 tons per year is to be implemented for nitrogen oxides and 210.3 tons per year for carbon monoxide in order to preclude Regulation 401 KAR 51:017, Prevention of significant deterioration of air quality.

Fuel gas heater emission factors were provided by the vendor and are located in table B-8 of the application.

The emergency fire-water pump emission factors are from Clarke\Detroit Diesel-Allison (vendor) for 300 hours per year operation (located in table B-4 of the application). The emergency fire-water pump sulfur dioxide emissions are based on diesel fuel sulfur content of 0.05 %.

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2. Applicable regulations:

Regulation 401 KAR 60:005, incorporating by reference 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines, for emissions unit with a heat input at peak load equal to or greater than 10 MMBTU/hour for which construction commenced after October 3, 1977

Regulation 401 KAR 60:005, incorporating by reference 40 CFR 60, Subpart A, General Provision

Regulation 401 KAR 59:015, New indirect heat exchangers, incorporating by reference 40 CFR 60, Subpart D

Regulation 401 KAR 60:005, incorporating by reference 40 CFR 60, Subpart Dc, Standards of performance for small industrial-commercial-institutional steam generating units

3. Regulations not applicable due to definition of affected facility:

Regulation 401 KAR 59:016, New electric utility steam generating units, incorporating by reference 40 CFR 60, Subpart Da

Regulation 401 KAR 60:005, incorporating by reference 40 CFR 60, Subpart Db, Standards of performance for industrial-commercial-institutional steam generating units

Regulation 401 KAR 51:017, Prevention of significant deterioration of air quality

4. Synthetic Minor - Pollutants and Emission Limitations:

The permit and source will be synthetic minor because potential emissions of greater than 250 tons per year are possible without the emissions caps being proposed for nitrogen oxides and carbon monoxide. The permittee has agreed to an emissions cap of 249 tons per year, based on any 12 consecutive months, for nitrogen oxides and 210.3 tons per year for carbon monoxide to preclude Regulation 401 KAR 51:017, Prevention of significant deterioration of air quality. The permittee may assure compliance for nitrogen oxides and carbon monoxide by use of continuous emission monitors or, while CEMs are not installed, by periodic monitoring, a calculation procedure based on EPA methods, and tracking of total emissions on a twelve (12) month rolling basis. While CEMs are not installed periodic monitoring for NOx must be conducted in accordance with 40 CFR 75, Appendix E. These requirements include initial performance testing at four different load points, correlating lb/mmBtu results to heat input rate, and retesting prior to the earlier of 3,000 unit operating hours or the 5-year renewal and anniversary of each unit's operating permit. Additionally, while CEMs are not installed periodic monitoring for CO must also be conducted. Initial

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performance testing shall correlate lb/mmBtu results to heat input rate, and retesting will occur prior to the 5-year renewal and anniversary of each unit's operating permit. The permittee shall also continuously monitor the flue gas temperature at the inlet and outlet of the oxidation catalyst and within 15,000 unit operating hours, each catalyst shall be assessed through catalyst core samples and replaced as necessary.

Initially CEMs will not be installed on the combustion turbines because projected operating capacities for the turbines are below the levels required by 40 CFR 75. However, if a combustion turbine's operations exceed a capacity factor of 20 percent in any calendar year or exceed a capacity factor of 10 percent averaged over three years, the permittee shall install, certify, and operate CEMs on that unit by December 31<sup>st</sup> the following calendar year. If natural gas fuel usage in the turbines exceeds 12,000 mmcf in a consecutive 12-month period, the permittee must have CEMs installed, certified, and operating on all six-combustion turbines. In addition, the permittee shall install, certify, and operate all required CEMs as necessary to comply with any new additional applicable regulations after issuance of the permit.

Sulfur content of natural gas fuel is being limited to the amount proposed in the application of 1.32 grain/100 SCF in order to preclude Regulation 401 KAR 51:017. This is necessary because the NSPS (40 CFR 60 Subpart GG) limitation of 0.8 weight percent sulfur in fuel would result in potential emissions greater than PSD thresholds.

Hazardous air pollutant (HAP) emissions are estimated to be less than 10 tons/year of a single one, and less than 25 tons/year of any combination of HAPs given the limitations necessary to maintain the emissions caps for nitrogen oxides and carbon monoxide, estimated for 2524 hours of operation, for each turbine; therefore, a case-by-case MACT is precluded.

### 5. Synthetic Minor - Control Device Requirements:

The permittee will operate dry low-nitrogen oxide burners with each gas-fired combustion turbine to attain a 9 ppmvd at 15 % oxygen NO<sub>x</sub> emission level.

The permittee will operate catalytic oxidizers with each gas-fired combustion turbine to control the CO emission level.

### 6. Additional Information Received

Additional information related to the Grane Creek project was submitted by the applicant and received on the following dates:

2/22/00, 4/28/00, 5/8/00, 5/12/00, 5/19/00, 6/6/00

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d. Conclusion:

With this construction, Grane Creek, LLC's potential emissions for this project are effectively limited to 248.5 tons per year for nitrogen oxides and 210 tons per year for carbon monoxide from the combustion turbines and natural gas heater, thus precluding a PSD review. The sulfur content of natural gas fuel is also limited below the 40 CFR 60 Subpart GG level to assure that PSD review is precluded. Emissions from insignificant activities are calculated to be 0.5 tons per year for nitrogen oxides and 0.3 tons per year for carbon monoxide. Hazardous air pollutants' emissions will be less than Title V levels given the limitations and operations necessary to achieve the nitrogen oxides and carbon monoxide emission levels. Thus a case-by-case MACT determination is not necessary.